

# Service Jobs and Education: Evidence from Tourism Shocks in Italy

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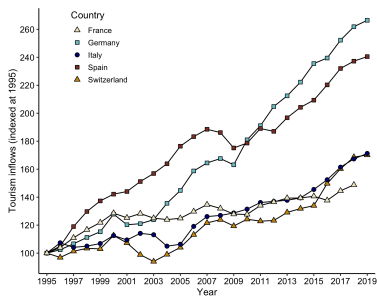
EEA, Rotterdam

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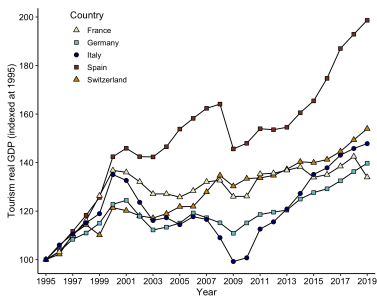
Increasing tourist arrivals are contributing to income growth worldwide.

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## Tourist arrivals



## Tourism real GDP



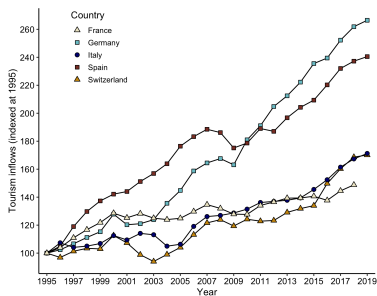
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Tourism increases (directly or indirectly) the demand for service jobs: occupations that involve assisting or caring for others (Autor and Dorn, 2013).

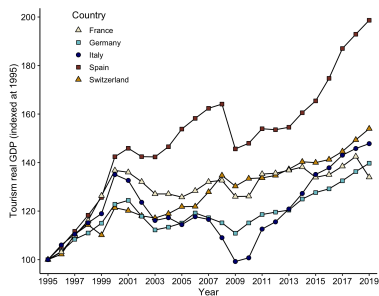
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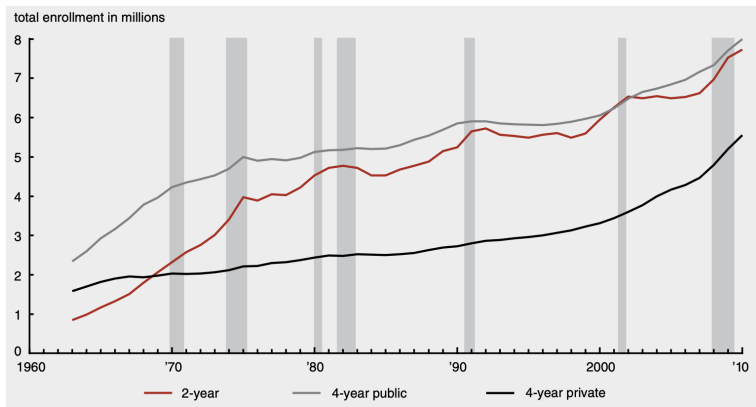
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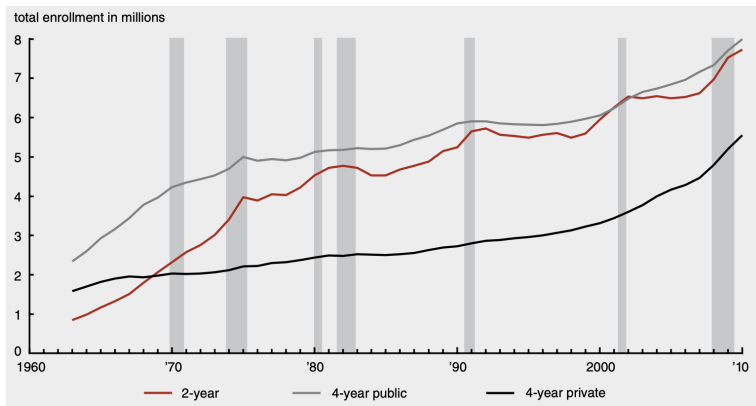
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**Research question.** What is the effect of short-term increases in demand for service jobs on human capital?

We exploit exogenous variation in foreign tourist arrivals in Italy, caused by terrorist attacks abroad, to analyze:

- ▶ College enrollment and completion choices of Italian students.

Italy provides a good laboratory to study the impact of tourism on education:


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
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**Educational Investment.** A priori, the effect of an increase in demand for service occupations on education is ambiguous:

- ▶ **Higher enrollment:** Tourism reduces financial and credit constraints for low-income individuals.
- ▶ **Lower enrollment:** Tourism increases opportunity costs of education. Less than 7 percent of tourism employees have a college education.

**Lifetime earnings.** Tertiary education is a pathway to economic mobility and higher earnings:

- ▶ **Lower wages:** Tourism employees have among the lowest wages within each job level.
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→ Reduces college enrollment and completion in the following year.

- ▷ The effect lasts longer for women;
- ▷ Lower enrollment in humanities and social sciences, no adjustment for hard sciences.

→ Increases the demand for low-skill labor increasing the opportunity cost of education.

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**Opportunity cost of education:** Black et al. (2005); Atkin (2016); Charles et al. (2018); Cascio and Narayan (2020); Sigurdsson (2024).

**Contribution:**

- ▷ We focus on service occupations, and in particular the tourism sector.
- ▷ We show the educational response to short-term (rather than long-run) shocks, identifying the timing and dynamics of the adjustment.
- ▷ We analyze a positive labor market shock that is unlikely to affect student's prospective labor market outcomes in the long run.

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**Outcomes:**

- ▶ **College enrollment:** Administrative data on the universe of college enrollment and graduation at the province level from Italian Ministry of Education (MIUR);
- ▶ **Labor market outcomes:** Labour Force Survey, microdata that provide information on individuals' demographics from Italian National Institute of Statistics (ISTAT);

**Exposure measure:**

- ▶ **Terrorist attacks:** Detailed information on attacks from Global Terrorism Database (GDT, University of Maryland); [◀ Info](#)
- ▶ **Tourism:**
  - ▶ Bank of Italy: Survey on International Tourism;
  - ▶ Compendium of Tourism Statistics from World Tourism Organization (UNWTO);

[▶ Summary](#)

We estimate the dynamic effect of exogenous tourism exposure on educational outcomes between 2010 and 2019 in yearly first-differences at the province level:

$$\Delta y_{pt} = \gamma_r + \theta_t + \sum_{k=6}^{k=0} \beta_{t+k} \ln \text{TourismExposure}_{pt+k} + X_{p,t_0} + \varepsilon_{pt}$$

- ▶  $\Delta y_{pt}$  is the change in the outcome variable between  $t - 1$  and  $t$ ;
- ▶  $\gamma_r$  are region FE and  $\theta_t$  are year FE;
- ▶  $X_{p,t_0}$  are province-level controls in 2010;
- ▶  $\text{TourismExposure}_{pt}$  is our exogenous measure of tourism exposure;
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We exploit changes in the (perceived) safety of alternative tourist destinations, by using exogenous variation generated by terrorist attacks abroad that reduce tourism flows to affected countries (Besley et al., 2020; Deem, 2020).

- ▶ **GTD definition:** *“An event in which a non-state actor uses force or violence aiming political, economic, religious, or social goals through fear.”*
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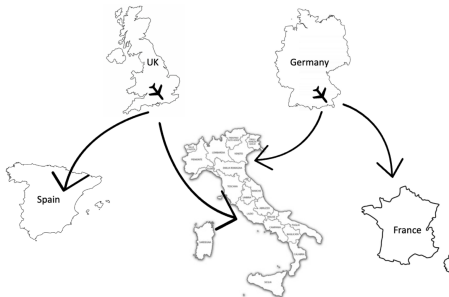
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*In Italy, Germans often visit the province of Verona, while British tourists often visit Rome.*

*While France is a popular tourist destination among Germans, few British tourists spend holidays there.*



*A security shock in France is likely to affect tourism inflows to Verona more than to Rome.*



Following González and Surovtseva (2023):

- ▶ We quantify the shock to perceived safety in foreign countries (e.g. number of attacks in France): ◀ Selection

$$\text{Shock}_{dt} = \sum_i \text{attack}_{idt} \quad (1)$$

- ▶ We quantify the intensity of tourist flows across countries (e.g. share of German tourists who visit France):

$$\text{OT}_{odt-1} = \frac{\text{outflow}_{odt-1}}{\sum_d \text{outflow}_{odt-1}} \quad (2)$$

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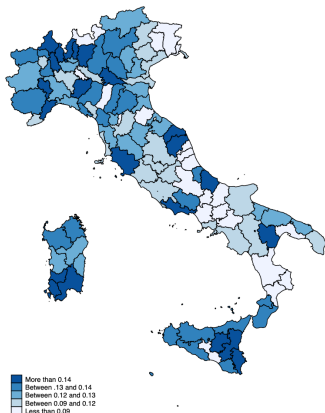
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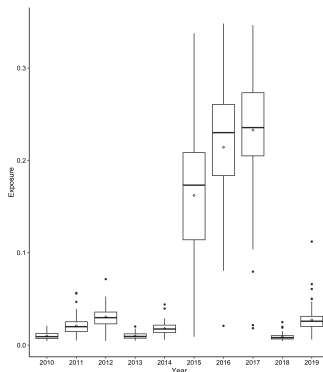
Combining the shares from (2) and (3) with the shift component (1), we obtain:

$$\text{Exposure}_{pt} = \sum_d \sum_o \underbrace{\left( \text{IN}_{opt-1} \cdot \text{OT}_{odt-1} \right)}_{\text{shares}} \cdot \underbrace{\text{Shock}_{dt}}_{\text{shift}}$$

Exposure across provinces

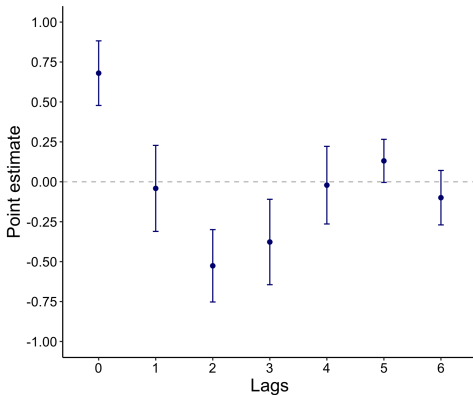


Exposure over time



$$\text{Reminder: } \Delta y_{pt} = \gamma_r + \theta_t + \sum_{k=0}^{k=6} \beta_{t+k} \hat{\varepsilon}_{pt+k} + X_{p,t0} + \varepsilon_{pt}$$

$\Delta \ln \text{ForeignTourists}_{pt}$



Foreign and Italians

Levels

**Tourism and education.** The effect of tourism exposure on:

- ▷ College enrollment and completion
- ▷ Heterogeneity by gender and field of study

**Mechanism.** Analysis of the mechanism through which tourism exposure affects education:

- ▷ Labor market effect

**IV estimates.** Quantification of the impact of tourism on education using 2SLS.



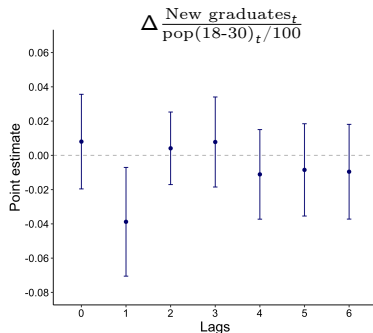
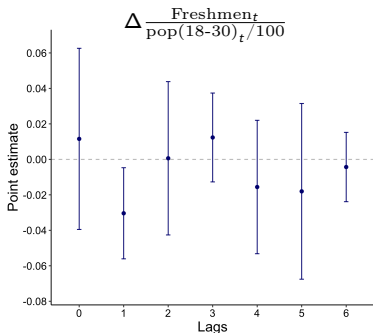
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A one standard deviation increase in our measure of exposure decreases

- ▶ College enrollment by  $\sim 75\%$  of the average change in enrollment (0.04 pp).
- ▶ College completion by  $\sim 50\%$  of the average change in completion (0.08 pp).

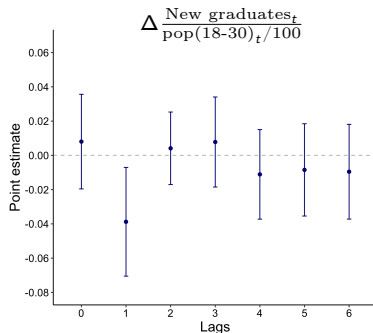
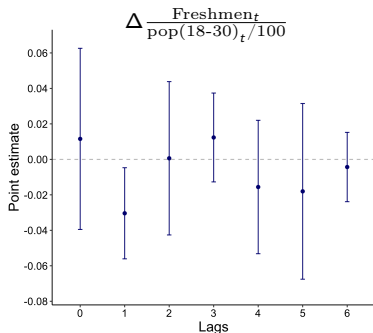
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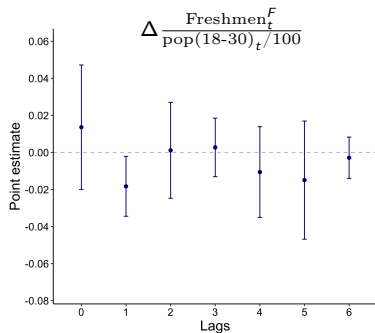
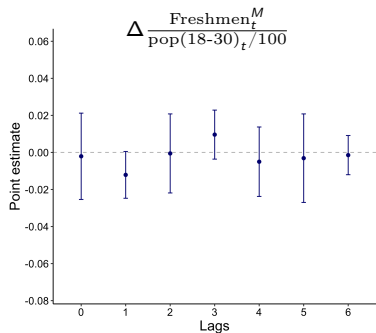
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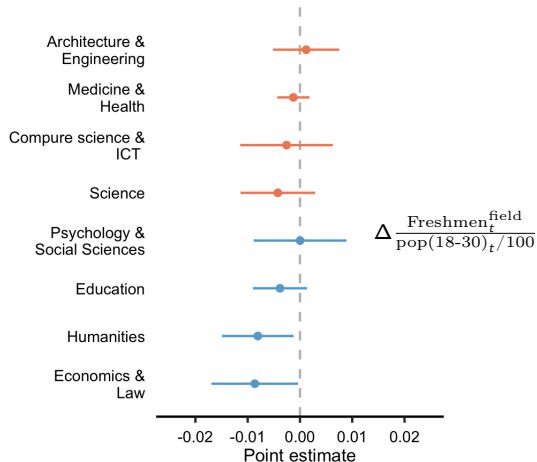
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We find a rebound for men's college enrollment in  $t + 3$ .

► Completion

Decomposition by field of study of the drop in enrollment estimated for lag 1.



Enrollment decreased primarily due to a decline in Humanities and Social Sciences, with no impact on enrollment in STEM and Health Sciences.

**Tourism and education.** The effect of tourism exposure on:

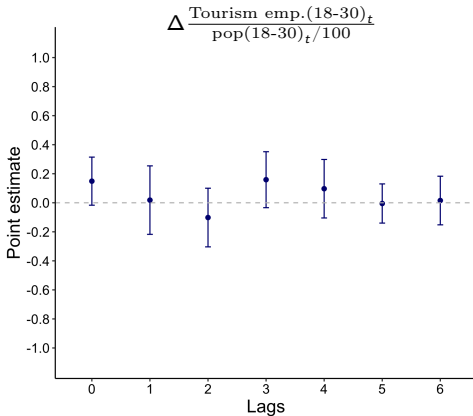
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▸ Total

▸ Low-skill

▸ Gender

▸ Participation

▸ Wages

**Tourism and education.** The effect of tourism exposure on:

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The identifying assumption is that terrorist attacks in foreign countries are:

- ▶ Correlated with tourism attractiveness of Italy (**relevance assumption**):

	$\Delta \ln(\text{ForeignTourists})_{t-1}$	
	Enrollment	Completion
	(1)	(2)
$\ln(\text{TourismExposure})_{t-1}$	0.728 *** (0.103)	0.622 *** (0.109)
Observations	918	918
KP F-stat	48.63	26.00
<i>Covariates</i>	✓	✓

- ▶ Unrelated with domestic labor market conditions (**exclusion restriction**):
  - ▶ Terrorist attacks abroad must affect the Italian labor market only through alterations of tourism inflows.
  - ▶ These events in general have limited impact on the overall economy of the country (González and Surovtseva, 2023).

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$$\Delta y_{pt} = \gamma_r + \theta_t + \beta \Delta \ln(\text{ForeignTourists})_{pt-1} + X_{p,t_0} + \varepsilon_{pt}$$

	Enrollment	Completion
	(1)	(2)
Panel A: First-stage		
$\ln(\text{Tourism exposure})_{t-1}$	0.728 *** (0.103)	0.622 *** (0.109)
Panel B: OLS		
$\Delta \ln(\text{Foreign tourists})_{t-1}$	-0.002 (0.007)	-0.013 * (0.007)
Panel C: IV		
$\Delta \ln(\text{Foreign tourists})_{t-1}$	-0.042 ** (0.021)	-0.059 ** (0.027)
Observations	918	918
KP F-stat	48.630	26.000
<i>Covariates</i>	✓	✓

The average yearly increase in tourism in our sample period (4.5%) reduces college enrollment and completion by 7%.

We study the impact short-term increases in demand for service jobs on human capital in Italy, exploiting exogenous variation in tourist arrivals.

- ▶ We find that tourism decreases college enrollment and completion.
- ▶ The drop in enrollment is driven by individuals who would have studied Humanities or Social Sciences.
- ▶ The effect is similar by gender but lasts longer for women (no rebound after the shock).

We find little evidence of individuals using the rise in labor demand as a means to fund their college education.

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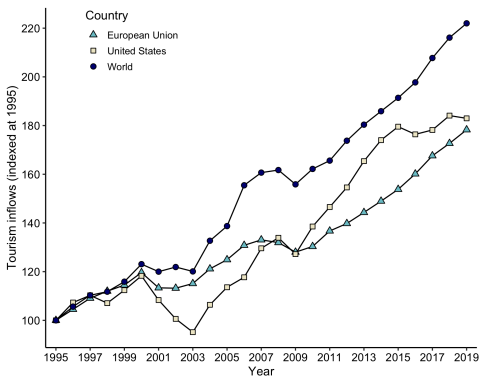
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Thank you!

- ▶ International tourist arrivals more than doubled in the last 25 years.
- ▶ Tourist expenses increased from nearly 0.6 to more than 1.8 trillion of 2019 US dollars between 2000 and 2019 (World Bank).



◀ Back





Variable	N	Mean	Std. Dev.	Min	Pctl. 25	Pctl. 50	Pctl. 75	Max
Share of students (18-30)	918	3.23	0.46	1.20	2.96	3.24	3.49	4.73
Share of completion (18-30)	918	3.77	0.58	1.34	3.38	3.76	4.13	5.56
$\Delta$ share of students (18-30)	918	0.05	0.20	-0.72	-0.08	0.05	0.18	0.98
$\Delta$ share of completion (18-30)	918	0.08	0.21	-0.68	-0.04	0.08	0.21	1.06
Population 18-30 (thousand)	918	79.88	90.40	11.09	33.40	51.05	91.02	562.51
Foreign tourists (thousand)	918	482.14	1 077.87	0.41	35.31	109.73	439.76	8 986.39
$\Delta$ ln Foreign tourists	918	4.44	46.16	-230.59	-15.87	4.69	24.37	366.22
Exposure	918	0.13	0.22	0.00	0.01	0.03	0.19	1.82

◀ Back

The Global Terrorism Database defines terrorism as:

*“An event in which a non-state actor uses force or violence aiming political, economic, religious, or social goals through fear.”*

This definition is rather broad and includes also violent acts that are unlikely to affect international tourism flows.

We restrict terrorist attacks to:

- ▷ Attacks with Islamic origin (Jihad, Islamic, Al-Qaeda, ISIS, ...)
- ▷ With at least ten victims involved, one of which 5 have to be a casualty

These attacks have the highest likelihood of reaching international media coverage, affecting international tourism (Besley et al., 2020; Deem, 2020):

- ▷ 1'081 attacks worldwide
- ▷ 19 attacks in Europe
- ▷ 10 attacks in western Europe

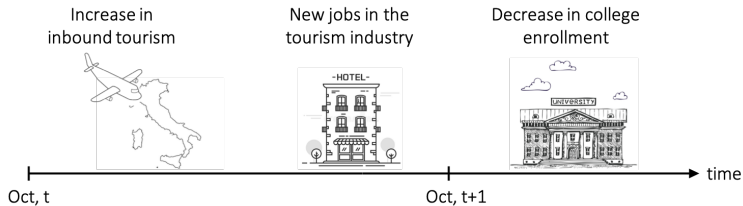
◀ Back

Country	Date	Summary	Attack type	Deaths	Wounded
Egypt	05/11/2014	An explosive device detonated on a train in Minuf city, Monufia governorate. [...]	Bombing/Explosion	4	9
France	5/11/2015	Two assailants stormed the offices of Charlie Hebdo, a satirical magazine [...]	Hostage Taking	12	12
United Kingdom	03/06/2017	Three assailants driving a van ran over pedestrians along the London Bridge [...]. After exiting the vehicle they ran towards the nearby Borough Market stabbing civilians in pubs and restaurants [...]	Armed Assault	11	48

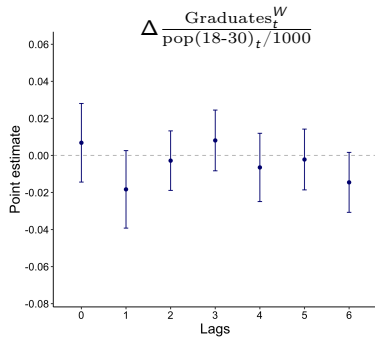
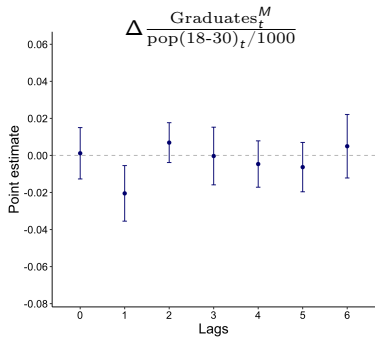
The database includes also information about the exact location of the attack, weapons used, targets, the perpetrator group name, the motive, etc.

[◀ Back](#)

We use academic years (Oct-Sep) rather than calendar years (Jan-Dec).

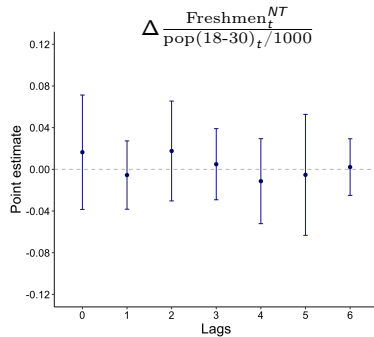
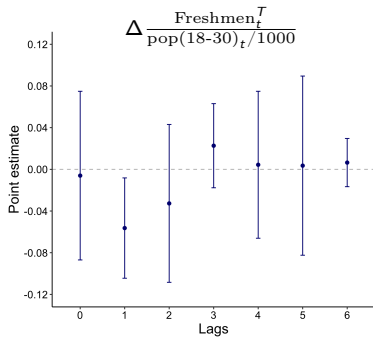


▶ Back



▶ Back

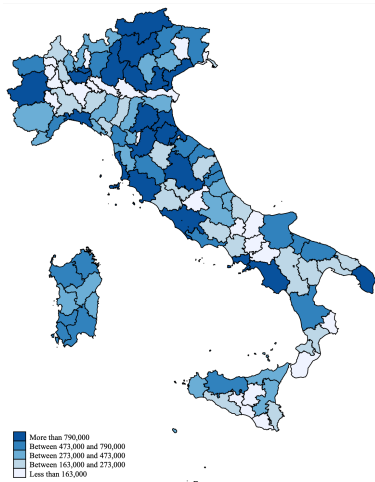




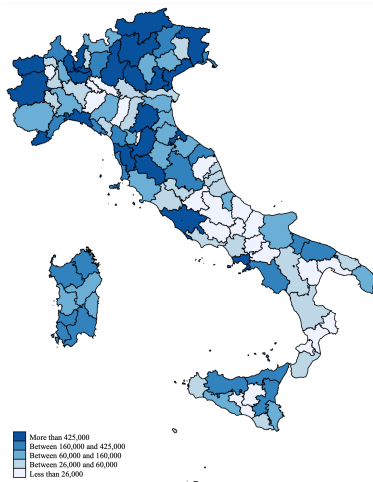
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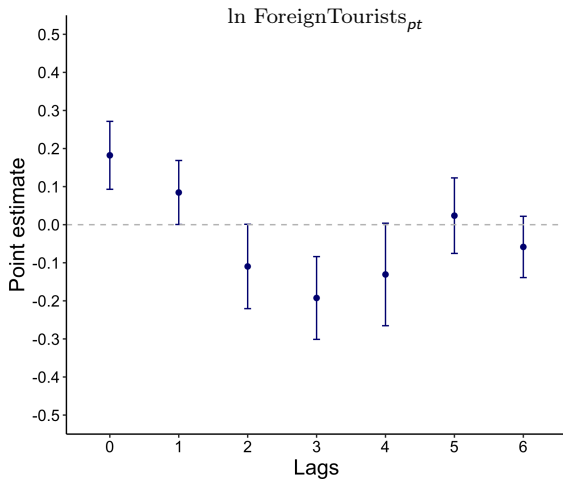
## Italian tourists



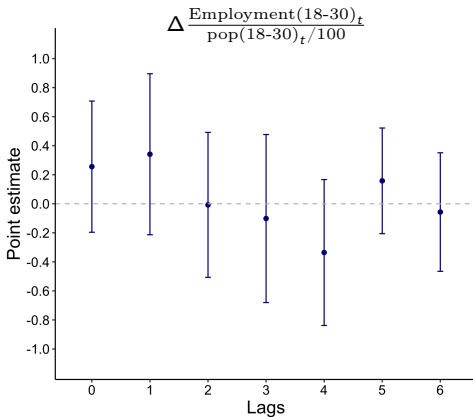
## Foreign tourists



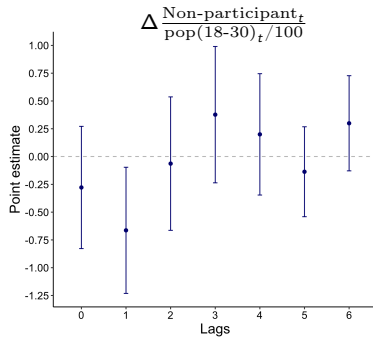
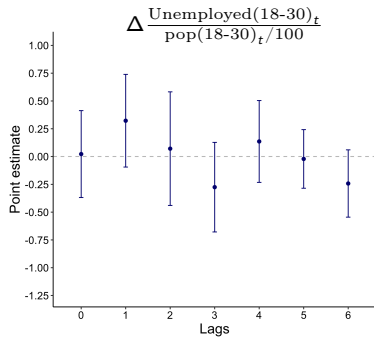
[◀ Back](#)



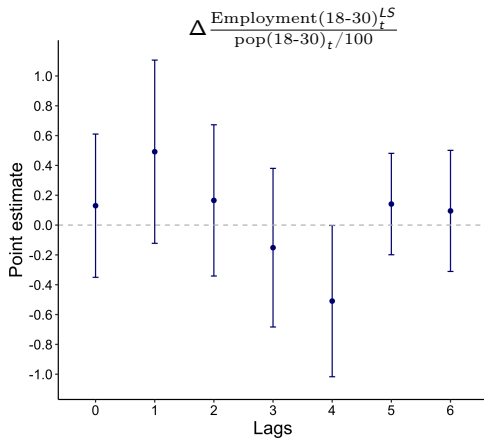
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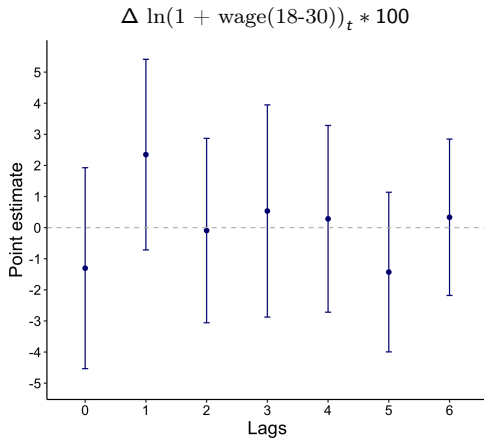
▶ Back



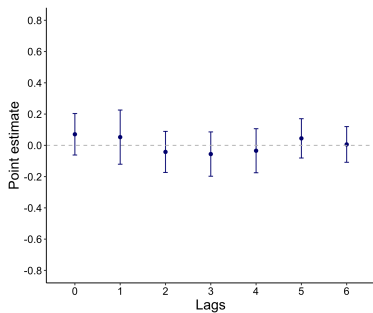
▶ Back



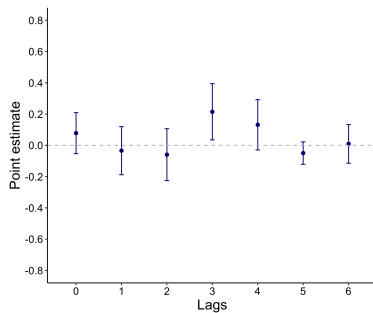
▶ Back

[▶ Back](#)

$$\Delta \frac{\text{Tourism emp.}(18-30)_t^M}{\text{pop}(18-30)_t/100}$$



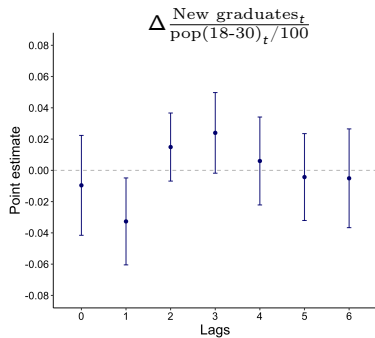
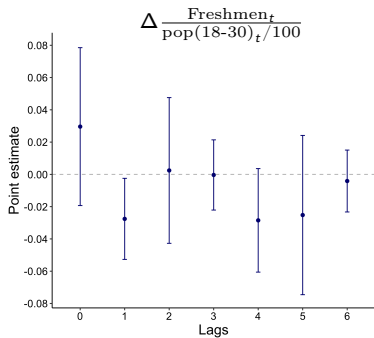
$$\Delta \frac{\text{Tourism emp.}(18-30)_t^F}{\text{pop}(18-30)_t/100}$$



▶ Back



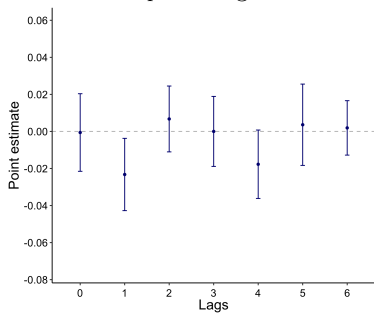




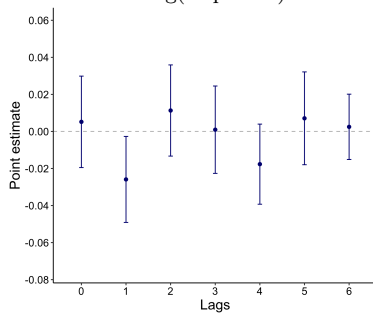
◀ Back

$$\Delta \frac{\text{Freshmen}_t}{\text{pop}(18-30)_t/100}$$

Separate regressions



log(Exposure)


[◀ Back](#)